

11. (Amended) A light bulb comprising:

a solid body having external walls defined by a first and second overlapping semi-ellipsoids, said first and second semi-ellipsoids each having distal ends opposite a first focal point and a target focal point proximate each said distal end, said first and second semi-ellipsoids overlapping with said first focal points coinciding to define a source focal point and said distal ends diametrically opposed; and

a light source supported by said body at said source focal point, said walls causing total internal reflection of light emitted by said source to focus at said target focal points.

REMARKS

Claims 1-15 are now pending in the application. The Examiner is respectfully requested to reconsider and withdraw the rejections in view of the amendments and remarks contained herein.

REJECTION UNDER 35 U.S.C. § 102

Claims 1, 3-6, 8-12, and 14-15 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Kato et al. (U.S. Pat. No. 5,416,669). This rejection is respectfully traversed.

Kato '669, Figure 6, discloses a substantially cylindrical case 7 having "an intermediate cylindrical portion 71, a right-side wall portion 72 and a left-side wall portion 73. A circular reflecting surface assembly 8 formed inside the case 7 comprises a group of right side ellipsoidal reflecting mirrors 8R and a group of left-side ellipsoidal

reflecting mirrors 8L." See column 5, lines 27-32. Kato therefore discloses a hollow body having machined internal circumferential surfaces which act to reflect light coincident thereon. The remaining figures of Kato showing the body, Figures 2-5, 7, 9-10 similarly show a hollow, internally machined body.

In direct contrast to Kato '669, amended claims 1, 6, and 11 of the present invention claim "a solid body having external walls" which act to cause total internal reflection of light coincident thereon. Kato '669 does not disclose or claim the Applicant's features of a solid body having external walls. Kato '669 therefore does not anticipate the Applicant's claimed invention of amended claims 1, 6, and 11. The Examiner is respectfully requested to withdraw the 35 U.S.C. § 102(b) rejection of independent claims 1, 6, and 11. Since rejected claims 3-5 depend directly from amended independent claim 1, rejected claims 8-10 depend either directly or indirectly from amended independent claim 6, and rejected claims 12 and 14-15 depend either directly or indirectly from amended independent claim 11, each of these claims is not anticipated by Kato '669 and should now be in a condition for allowance. The Examiner is therefore respectfully requested to withdraw the 35 U.S.C. § 102(b) rejection of dependent claims 3-5, 8-10, 12 and 14-15.

REJECTION UNDER 35 U.S.C. § 103

Claims 2, 7, and 13 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Kato et al. (U.S. Pat. No. 5,416,669) in view of Parkyn Jr. et al. (U.S. Pat. No. 5,926,320). This rejection is respectfully traversed.

Kato '669 teaches away from the solid body of the Applicant. Kato '669 teaches multiple examples of a body having multiple, internally machined mirror surfaces which reflect coincident light toward optical fibers disposed at opposed ends of the body. The mirror surfaces are angled to reflect most of the light from the light source 1 to one of the two optical fibers 4,5. See column 3, lines 51-63. Kato '669 specifically teaches the use of internally machined surfaces. The presence of internally machined surfaces would at least partially destroy the reflectivity of the Applicant's solid body. Many of the Kato case designs additionally require ventilation holes to provide ventilation air flow to the inner chamber of the case, which are not required by and would partially destroy the reflectivity of the Applicant's solid body. Kato '669 also does not teach or suggest the Applicant's use of a solid body, (having no internally formed reflective surfaces), which reflects light from external walls or surfaces. The external walls of the Kato case are not dimensionally shaped and will not function to provide total or near total reflection of incident light rays to a desired focal point as taught by the Applicant.

Parkyn '320 is relied on by the Examiner for its disclosure of "a filament in order to produce light at a high efficiency". Parkyn teaches "to increase light utilization by reducing Fresnel reflections at the boundary between a light source and a lens element, by making the lens element integral or in optical contact with the light source." See column 2, line 66 to column 3, line 2. A light source 1 generates rays which are reflected off multiple surfaces of a lens, where the lens can be formed of one or more parts. The light is reflected primarily from a paraboloidal surface 12, then refracted by a cone surface 13 and subsequently emitted as a ray. The lens parts are hollow and generally have multiple curve geometries and a plurality of surfaces. See Figures 5 and 6. Parkyn

'320 does not teach or suggest the Applicant's use of a solid body, (having no internally formed reflective surfaces), which reflects light from external walls or surfaces. Parkyn therefore does not teach or suggest the solid body of amended claims 1, 6 and 11.

In direct contrast to both Kato and Parkyn, the Applicant's claims 2, 7, and 13, which depend from amended claims 1, 6, and 11, respectively, provide a solid body having external walls which reflect light from the light source. Claims 2, 7 and 13 further limit the parent claims by adding the feature of a filament to the light source. The suggested modification of Kato and Parkyn cannot therefore be made since the combination of Kato and Parkyn will not function to reflect light through a solid body and off the external wall or surface to target focal points. The Kato and Parkyn references therefore cannot form the basis for a 35 U.S.C. § 103(a) rejection of claims 2, 7, and 13, which claim a light source including a filament and modify amended Claims 1, 6 and 11, respectively.

The Examiner is respectfully requested to withdraw the 35 U.S.C. § 103(a) rejection of Claims 2, 7, and 13.


CONCLUSION

It is believed that all of the stated grounds of rejection have been properly traversed, accommodated, or rendered moot. Applicant therefore respectfully requests that the Examiner reconsider and withdraw all presently outstanding rejections. It is believed that a full and complete response has been made to the outstanding Office Action, and as such, the present application is in condition for allowance. Thus, prompt and favorable consideration of this amendment is respectfully requested. If the

Examiner believes that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at (248) 641-1600.

Respectfully submitted,

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ATTACHMENT FOR CLAIM AMENDMENTS

The following is a marked up version of each amended claim in which underlines indicates insertions and brackets indicate deletions.

1. (Amended) A light emitting apparatus comprising:
a solid body having external walls defining a source focal point within said body and target focal points adjacent opposite ends of said body; and
a light source disposed within said body at said source focal point;
wherein the walls of said body cause total internal reflection of light emitted from said source focal point to said target focal points.

6. (Amended) A light bulb for reflecting internally generated light, said light bulb comprising:
a solid body having external walls defining a source focal point within said body and target focal points adjacent opposite ends of said body, said walls defined by a first and second overlapping semi-ellipsoids, said opposite ends defined by conical end portions extending from said semi-ellipsoids; and
a light source disposed within said body at said source focal point, said walls of said body causing total internal reflection of light emitted from said light source to said target focal points.

11. (Amended) A light bulb comprising:

a solid body having external walls defined by a first and second overlapping semi-ellipsoids, said first and second semi-ellipsoids each having distal ends opposite a first focal point and a target focal point proximate each said distal end, said first and second semi-ellipsoids overlapping with said first focal points coinciding to define a source focal point and said distal ends diametrically opposed; and

a light source supported by said body at said source focal point, said walls causing total internal reflection of light emitted by said source to focus at said target focal points.